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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/985,998	11/07/2001	Hiroyuki Ishinaga	35.G2927	4582

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EXAMINER

TRAN, HUAN HUU

ART UNIT PAPER NUMBER

2861

DATE MAILED: 09/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/985,998

Applicant(s)

ISHINAGA ET AL.

Examiner

Huan H. Tran

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 18-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

Art Unit: 2861

**DETAILED ACTION**

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Objections***

2. Claim 24 is objected to because of the following informalities: Claim 24, the preamble should be changed to -A liquid discharge head- to be consistent with that in base claim 19. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 19-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 and dependent claims thereof, "said plurality of dots" (claim 19, line 10) lacks antecedent basis. It should be changed to "said plurality of droplets".

Claim 24, "a front satellite droplet", "a rear satellite droplet" lack antecedent basis. What is the relationship between the front and rear satellite droplets and the plurality of satellite droplets recited in base claim 19?

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2861

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 18 rejected under 35 U.S.C. 102(e) as being clearly anticipated by Misumi et al. (US Patent No. 6409296).

With reference to Figs. 1 and 2, Misumi et al. discloses a liquid discharge apparatus, comprising: a liquid discharge head which includes a discharge port (18) constituting the portion for discharging liquid, an energy generating element (2) generating the energy for discharging liquid, and liquid flow paths (10) communicating with said discharge port and equipped with said energy generating element, which forms a plurality of droplets by discharging said liquid from said discharge port by the energy of said energy generating element, and which performs recording by shooting said plurality of droplets onto a recording medium; and

a carriage (Fig. 13, HC) for conveying said liquid discharge head relative to the recording medium,

wherein said liquid discharge head forms said plurality of droplets using a main droplet which flies at the start; and a droplet formed by coalescing a plurality of satellite droplets discharged as a result of the discharge action of said main droplet, before said satellite droplets have been shot onto said recording medium; and wherein said liquid discharge head shoots said plurality of droplets onto the recording medium with a space interposed therebetween.

The functional wherein statement is noted but is not given patentable weight as the claim does not positively set forth any structure, e.g. a head driver, in the claim which is responsible for the recited functions and results. It is submitted that the structure defined by the liquid discharge head does not support the stated functions and results. See *In re DALTON AND COOLEY*, 89 USPQ 271 (CCPA 1951) (In order for claims drawn to define structure to be patentable, they must depend upon novel structure set out; properties, functions, uses, and results that may appear from defined structure are not definitions of it and may not be solely relied upon to make claim containing them patentable unless there is positive setting out of structure itself in claims which must be responsible for properties, functions, uses, and results thereof.); *In re MASON*, 114 USPQ 127 (CCPA 1957) (Functional statement cannot serve to distinguish claims, which are not process claims, from reference since it does not define any structure)

Art Unit: 2861

7. Claims 19-24 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Misumi et al.

With reference to Figs. 1 and 2, Misumi et al. discloses a liquid discharge head which includes a discharge port (18) constituting the portion for discharging liquid, an energy generating element (2) generating the energy for discharging liquid, and liquid flow paths (10) communicating with said discharge port and equipped with said energy generating element, which forms a plurality of droplets by discharging said liquid from said discharge port by the energy of said energy generating element, and which performs recording by shooting said plurality of droplets onto a recording medium,

wherein said plurality of dots is formed of a main droplet which flies at the start; and a droplet formed by coalescing, after capturing, a plurality of satellite droplets which is discharged as a result of the discharge action of said main droplet, before said satellite droplets have been shot onto said recording medium.

The functional wherein statement is noted but is not given patentable weight as the claim does not positively set forth any structure, e.g. a head driver, in the claim which is responsible for the recited functions and results. It is submitted that the structure defined by the liquid discharge head does not support the stated functions and results. See *In re DALTON AND COOLEY*, 89 USPQ 271 (CCPA 1951) (In order for claims drawn to define structure to be patentable, they must depend upon novel structure set out; properties, functions, uses, and results that may appear from defined structure are not definitions of it and may not be solely relied upon to make claim containing them patentable unless there is positive setting out of structure itself in claims which must be responsible for properties, functions, uses, and results thereof.); *In re MASON*, 114 USPQ 127 (CCPA 1957) (Functional statement cannot serve to distinguish claims, which are not process claims, from reference since it does not define any structure)

With respect to claim 20, the energy generating element (2) is an electrothermal transducer.

With respect to claim 21, Misumi et al. also teaches the limitation "wherein said electrothermal transducer is used for generating film boiling phenomena, and wherein said liquid discharge head further comprises a movable member which is displaced by the growth of a bubble due to said film boiling, and a controlling portion for controlling the displacement of said movable member so as to be within a desired range". See Figs. 1 and 2 and the detailed description thereof.

Art Unit: 2861

It should be noted that the wherein statements in claims 22-24 define the weight, speed of the satellite droplets which are not structure of the claimed liquid discharge head.

***Allowable Subject Matter***

8. Claims 1-12, 13-15, 16-17 are allowed.

The following is an examiner's statement of reasons for allowance: With respect to claim 1 and dependent claims thereof, prior art of record do not teach or suggest at least the limitations projecting a liquid column from said discharge port; separating a main droplet from the tip of said liquid column; discharging said liquid column after said main droplet has been separated, and separating said liquid column into a plurality of satellite droplets; and coalescing said plurality of satellite droplets. In Misumi et al. the satellite droplets are generated by associated pulses. See Figs. 1-2 and the description thereof.

With respect to independent claim 13 and dependent claims thereof, prior art of record do not teach or suggest the limitation that the plurality of satellite droplets which are discharged as a result of the discharge action of said main droplet. In Misumi et al. the satellite droplets are generated by associated pulses. See Figs. 1-2 and the description thereof.

With respect to claim 16 and dependent claim thereof, prior art of record do not teach or suggest the limitation that an image is formed by using a pair of reactive inks constituted of a black ink and a color ink as said droplets, and by superimposing a plurality of dots of said color ink on each dot of the black ink, each of the dots of said color ink being smaller than the dot of said black ink.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huan H. Tran whose telephone number is (703) 308-0749. The examiner can normally be reached on M-F with Monday off, from 7:30am to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Fuller can be reached on (703) 308-0079. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 2861

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1749.

A handwritten signature in black ink, appearing to read 'Huan H. Tran', with a long horizontal flourish extending to the right.

Huan H. Tran  
Primary Examiner  
Art Unit 2861

hht